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14. ABSTRACT The purpose of this report is to summarize briefly the history of the Surface Water Research project since its inception in 1952, the work accomplished, and the problems encountered. In general, each topic is discussed under two periods of time: 1952-1963, when projects were confined to the Helmand River Valley and was entitled "Helmand Surface Water Investigations (306-12-021, 306-M-12-AD and 306-AC-12-AD5)," and 1963-1969 when activities were expanded to cover most of Afghanistan and title was changed to "Surface Water Research (306-11-190-002)". Prepared by the United States Geological Survey in cooperation with the Water and Soil Survey Department, Ministry of Agriculture and Irrigation, Royal Government of Afghanistan under the auspices of the United States Agency for International Development. "The primary objective in the hydrologic program is the surface-water investigation to obtain data that will permit a sound determination of the hydrologic regimen of the Helmand River system; the second, long term objective, is to prepare Afghan personnel to carry on the investigation so as to assume ultimate responsibility."					
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appendix 9

Appendix 9

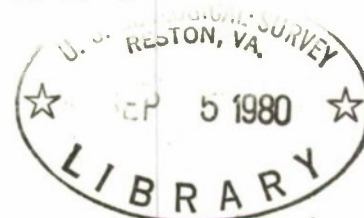
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Numbers: 503-12-021
306-M-12-AD
503-AC-12-AD-5

By R. H. Brigham
Hydrologist, U. S. Geological Survey
July 1963.



GENERAL HISTORY

Mr. L. J. Snell arrived in Afghanistan in 1952 under Technical Cooperation Administration and continued the stream gaging program which had been started by Morrison Knudsen Afghanistan in 1947. A Participating Agency Service Agreement was signed between the United States Geological Survey and Foreign Operations Administration November 8, 1954. The project has been continuous under the Hydrologic Advisors, L. J. Snell, 1952-57; I. A. Heckriller, June 1954 to June 1959; and R. H. Brigham, November 1959 to June 1963, when its activities were transferred by the Royal Government of Afghanistan to the Water and Soils Survey Authority under presidency of Mir Akber Raza, with headquarters in Kabul.

PROGRAM

DESCRIPTION AND OBJECTIVES OF THE PROJECT (From Project Agreement):

"The primary objective in the hydrologic program is the surface-water investigation to obtain data that will permit a sound determination of the hydrologic regimen of the Helmand River system; the second, long-term objective, is to prepare Afghan personnel to carry on the investigation so as to assume ultimate responsibility."

The services rendered under the above objectives and the data collected on the water resources are necessary and basically support the overall development of land and water resources of the Helmand Valley. Surface water control and utilization will also aid in planning means of increased agricultural production and industrial development.

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To meet these objectives the following has been done:

Nineteen stream-flow stations have been operated in the Helmand Valley.

The operation of the network of stream-gaging stations, as in any area, includes the maintenance of all equipment needed at the stations. Flood damage on shifting controls have since 1956 necessitated many repairs and relocations.

The daily discharge records through September 1962 have been computed, assembled and forwarded to the United States Geological Survey, Section of Reports, Washington, D.C. where they are reviewed and edited for theory, continuity and accuracy. During the last two years, all of the hydrologic data collected in the Helmand River Basin through September 30, 1960, has been compiled, analyzed and typed preparatory to publication and comprises a report of 137 station years of stream flow record, results of 126 canal discharge measurements, 60 years of climatological data at 10 stations of from 1 to 19 years duration. It also contains the contents at end of each month for Arghandab and Kajakai Reservoirs from the time they were started until September 30, 1960, and results of 7 years of snow surveys. This compiled hydrologic data has been reviewed in the U.S.G.S. Washington Office but as yet no approval to publish has been granted by the Royal Government of Afghanistan.

Current computations of the daily records of inflow, outflow, contents and evaporation losses for the Arghandab and Kajakai Reservoirs are prepared each month and distributed.

Current records of rainfall, evaporation, wind velocity, humidity and temperatures at Lashkar Gah, together with the summarized reservoir data, are prepared and distributed monthly as a Hydrologic Summary. This Hydrologic Summary is the medium used to present comments on stream flow, reservoir status and runoff expectancy.

Climatological data is currently being collected at Lashkar Gah, Kandahar, Kala Kang, Arghandab Reservoir, Kajakai Reservoir and Darweshan. Limited weather data has been collected for short periods at a few other sites.

The Nawar Basin is a large land locked drainage basin whose valley floor is above 10,000 feet elevation. This basin serves as a natural mountain reservoir, feeding mountain runoff to springs about 500 feet lower over the summer months. This basin and its large valley lake is an excellent hydrologic indicator in the headwaters of the Helmand and Kabul Rivers. During the past two years, staff gages have been set in the lake and records of lake stage and snow fall were collected through the 1962-63 winter and runoff season. A permanent observer has been employed there, after training in Lashkar Gah. We hope to use the data collected here, together with the snow surveys of the Ghazni area, correlated with the runoff records, to forecast the seasonal runoff to be expected.

The Hydrology Unit has closely cooperated with the Engineering Department and the Operations and Maintenance Department of Helmand Valley Authority and has furnished advisory services on hydrology. The monthly reports and discharge records have been distributed to AID and HVA authorities where requested.

An important objective of this project was to train Afghan personnel and develop an organization to carry on with this type of program. Progress has been made toward this objective. A Civil Engineer with a B.S. degree from the University of Wyoming, Ghulam Dastgir Shan, now is in charge of the unit and two 12th grade graduates and a man of long experience form a good nucleus with field work experience and limited office work capability. Two men are also receiving training - one in the U.S. and one in India - working toward B.S. Degrees.

All personnel received training in field and office procedure as well as in the taking care of the equipment and instruments used in both field and office. This means that the Hydrology Unit has four men of fair competence on its staff, of which one is proposed for participant training in the United States in 1964. At this writing in June 1963, four 12th class graduates of Lashkar Gah High School have been employed by the Unit and their on-the-job training has begun.

HELMAND VALLEY AUTHORITY PARTICIPATION:

The H.V.A. has provided a budget of funds to:

Provide vehicles and transportation costs for servicing the river gaging and climatological stations.

Pay for the observers or watchmen at the stations.

Pay for an adequate staff, if they could be found, even though the pay is low.

Pay for needed locally procurable supplies for construction and maintenance of the gaging stations.

Provide office and warehouse facilities to accommodate the needs of the Hydrology Unit.

AGENCY FOR INTERNATIONAL DEVELOPMENT PARTICIPATION:

The A.I.D. provides:

The services of an American Technical Advisor on Hydrology.

A vehicle and transportation cost for the technician.

The necessary scientific and operational equipment essential to the effective operation of the Hydrology Unit and which must be procured abroad.

RECOMMENDATIONS:

In the Unit:

Encourage the Afghan staff to work pride and responsibility into the job that is their

Continue to program work and assist staff to develop competence to carry out assignments.

Give instruction on process of analyzing the base data collected and therefrom compute the records of runoff and summarization of results.

To stimulate an awareness of importance of the work of which their job is a part.

Continued organization and training of the staff into an effective, dependable operating unit.

Give acknowledgment for improved competence with on-the-job training by making pay adjustments conducive to job continuance in that field of training.

To Helmand Valley Authority:

Support the effort of the Unit to recruit and train a staff of young men for work on the water resources.

Cooperate with the Water and Soils Survey Authority so that it is not hampered by assisting its personnel on housing, warehousing, and office needs.

Give assistance in improved vehicle maintenance and servicing at Lashkar Gah, as possible.

To Agency for International Development:

Continue the services of technical advisors in hydrology for a few more years with the objective of improved organization of the national Water and Soils Survey Authority and extension of good techniques in collection of basic records and the evaluation of those records for better water utilization.

SUMMARY

In summary, a substantial base of hydrologic information for the Helmand River Basin has been compiled but, until it is published and disseminated for use, its potential value

for area development is but partially realized. In the process of collecting these records of river runoff, a small group of Afghans have received on-the-job technical training and developed an ability to proceed with this work. The decision of the Royal Government of Afghanistan to extend the hydrologic activity to the rest of the country has been a major step toward successful evaluation of the project activity in Afghanistan. It will permit a more complete assessment of this valuable renewable resource (water) in this fuel short country. We urge continued support for the Hydrologic Unit, but would emphasize the need for a definite schedule of records publication at about five year intervals.